

Title (en)

PLANT REGULATORY ELEMENTS AND USES THEREOF

Title (de)

PFLANZENREGULIERUNGSELEMENTE UND VERWENDUNGEN DAVON

Title (fr)

ÉLÉMÉNTS RÉGULATEURS DE PLANTES ET LEURS UTILISATIONS

Publication

EP 3613279 A1 20200226 (EN)

Application

EP 19197949 A 20140312

Priority

- US 201361785245 P 20130314
- EP 14774111 A 20140312
- US 2014024511 W 20140312

Abstract (en)

The invention provides recombinant DNA molecules and constructs, and their nucleotide sequences, useful for modulating gene expression in plants. The invention also provides transgenic plants, plant cells, plant parts, and seeds comprising a recombinant DNA molecule comprising a DNA molecule operably linked to a heterologous transcribable DNA molecule, as well as methods of their use.

IPC 8 full level

A01H 1/00 (2006.01); **C07K 14/415** (2006.01); **C12N 15/82** (2006.01)

CPC (source: CN EP RU US)

C07K 14/415 (2013.01 - CN EP RU US); **C12N 9/2402** (2013.01 - CN); **C12N 15/8212** (2013.01 - CN EP RU US);
C12N 15/8216 (2013.01 - CN EP RU US); **C12N 15/8225** (2013.01 - EP RU US); **C12N 15/8227** (2013.01 - EP RU US);
C12N 15/8241 (2013.01 - RU US); **C12N 15/8274** (2013.01 - RU US); **C12N 15/8279** (2013.01 - RU US); **C12Y 302/01056** (2013.01 - CN);
Y02A 40/146 (2018.01 - EP)

Citation (applicant)

- US 6603061 B1 20030805 - ARMSTRONG CHARLES L [US], et al
- US 7193133 B2 20070320 - LASSNER MICHAEL [US], et al
- US 6803501 B2 20041012 - BAERSON SCOTT R [US], et al
- US 6448476 B1 20020910 - BARRY GERARD F [US]
- US 6248876 B1 20010619 - BARRY GERARD FRANCIS [US], et al
- US 6225114 B1 20010501 - EICHHOLTZ DAVID ALAN [US], et al
- US 6107549 A 20000822 - FENG PAUL C C [US], et al
- US 5866775 A 19990202 - EICHHOLTZ DAVID ALAN [US], et al
- US 5804425 A 19980908 - BARRY GERARD FRANCIS [US], et al
- US 5633435 A 19970527 - BARRY GERARD F [US], et al
- US 5463175 A 19951031 - BARRY GERARD F [US], et al
- US RE38446 E 20040224 - VAN ASSCHE CHARLES [FR], et al
- US 6716474 B2 20040406 - BARRY GERARD F [US], et al
- US 6663906 B2 20031216 - BARRY GERARD F [US], et al
- US 6476295 B2 20021105 - BARRY GERARD FRANCIS [US], et al
- US 6441277 B1 20020827 - BARRY GERARD F [US], et al
- US 6423828 B1 20020723 - BAUM JAMES A [US], et al
- US 6399330 B1 20020604 - DONOVAN WILLIAM P [US], et al
- US 6372211 B1 20020416 - ISAAC BARBARA G [US], et al
- US 6235971 B1 20010522 - BARRY GERARD FRANCIS [US], et al
- US 6222098 B1 20010424 - BARRY GERARD FRANCIS [US], et al
- US 5716837 A 19980210 - BARRY GERARD FRANCIS [US], et al
- US 6809078 B2 20041026 - BAUM JAMES A [US], et al
- US 6713063 B1 20040330 - MALVAR THOMAS [US], et al
- US 6686452 B2 20040203 - RUPAR MARK J [US], et al
- US 6657046 B1 20031202 - ALIBHAI MURTAZA F [US], et al
- US 6645497 B2 20031111 - MALVAR THOMAS [US], et al
- US 6642030 B1 20031104 - ENGLISH LEIGH H [US], et al
- US 6639054 B1 20031028 - ALIBHAI MURTAZA F [US], et al
- US 6620988 B1 20030916 - ENGLISH LEIGH H [US], et al
- US 6593293 B1 20030715 - BAUM JAMES A [US], et al
- US 6555655 B1 20030429 - RUPAR MARK J [US], et al
- US 6538109 B2 20030325 - MALVAR THOMAS [US], et al
- US 6537756 B1 20030325 - RUPAR MARK J [US], et al
- US 6521442 B2 20030218 - MALVAR THOMAS [US], et al
- US 6501009 B1 20021231 - ROMANO CHARLES P [US]
- US 6468523 B1 20021022 - METTUS ANNE-MARIE LIGHT [US], et al
- US 6326351 B1 20011204 - DONOVAN WILLIAM P [US], et al
- US 6313378 B1 20011106 - BAUM JAMES A [US], et al
- US 6284949 B1 20010904 - FISCHHOFF DAVID A [US], et al
- US 6281016 B1 20010828 - MALVAR THOMAS [US], et al
- US 6248536 B1 20010619 - DONOVAN WILLIAM P [US], et al
- US 6242241 B1 20010605 - MALVAR THOMAS [US], et al
- US 6221649 B1 20010424 - MALVAR THOMAS [US], et al
- US 6177615 B1 20010123 - BAUM JAMES A [US]
- US 6156573 A 20001205 - MALVAR THOMAS [US], et al
- US 6153814 A 20001128 - BAUM JAMES A [US], et al
- US 6110464 A 20000829 - MALVAR THOMAS [US], et al

- US 6093695 A 20000725 - RUPAR MARK J [US], et al
- US 6063756 A 20000516 - DONOVAN WILLIAM P [US], et al
- US 6063597 A 20000516 - ENGLISH LEIGH H [US], et al
- US 6023013 A 20000208 - ENGLISH LEIGH H [US], et al
- US 5959091 A 19990928 - WATRUD LIDIA S [US], et al
- US 5942664 A 19990824 - BAUM JAMES A [US], et al
- US 5942658 A 19990824 - DONOVAN WILLIAM P [US], et al
- US 5880275 A 19990309 - FISCHHOFF DAVID A [US], et al
- US 5763245 A 19980609 - GREENPLATE JOHN T [US], et al
- US 5763241 A 19980609 - FISCHHOFF DAVID A [US], et al
- US 6653280 B2 20031125 - LIANG JIHONG [US], et al
- US 6573361 B1 20030603 - BUNKERS GREG J [US], et al
- US 6506962 B1 20030114 - BOUGRI OLEG V [US], et al
- US 6316407 B1 20011113 - LIANG JIHONG [US], et al
- US 6215048 B1 20010410 - LIANG JIHONG [US], et al
- US 5516671 A 19960514 - LAWRENCE ELLEN B [US], et al
- US 5773696 A 19980630 - LIANG JIHONG [US], et al
- US 6121436 A 20000919 - LIANG JIHONG [US], et al
- US 6617496 B1 20030909 - MCCORMICK FRANCIS P [US], et al
- US 6608241 B1 20030819 - BEACHY ROGER N [US], et al
- US 6015940 A 20000118 - KANIEWSKI WOJCIECH KAZIMIERZ [US], et al
- US 6013864 A 20000111 - MITSKY TIMOTHY ALBERT [US], et al
- US 5850023 A 19981215 - ELMER JAMES SCOTT [US], et al
- US 5304730 A 19940419 - LAWSON EDGAR C [US], et al
- US 6228992 B1 20010508 - JESSEN HOLLY J [US], et al
- US 6723897 B2 20040420 - BROWN SHERRI M [US], et al
- US 6518488 B1 20030211 - AGARWAL AMEETA [US], et al
- US 6538181 B1 20030325 - STALKER DAVID M [US], et al
- US 6538179 B1 20030325 - BARRY GERARD FRANCIS [US], et al
- US 6538178 B1 20030325 - KISHORE GANESH MURTHY [US]
- US 5750876 A 19980512 - BARRY GERARD FRANCIS [US], et al
- US 6444876 B1 20020903 - LASSNER MICHAEL W [US], et al
- US 6426447 B1 20020730 - KNAUF VIC C [US], et al
- US 6380462 B1 20020430 - KRIDL JEAN [US]
- US 6495739 B1 20021217 - LASSNER MICHAEL W [US], et al
- US 5608149 A 19970304 - BARRY GERARD F [US], et al
- US 6483008 B1 20021119 - DEHESH KATAYOON [US], et al
- US 6828475 B1 20041207 - METZ JAMES GEORGE [US], et al
- US 6822141 B2 20041123 - LARDIZABAL KATHRYN DENNIS [US], et al
- US 6770465 B1 20040803 - DEHESH KATAYOON [US], et al
- US 6706950 B2 20040316 - DEHESH KATAYOON [US]
- US 6660849 B1 20031209 - DEHESH KATAYOON [US]
- US 6596538 B1 20030722 - LARDIZABAL KATHRYN DENNIS [US], et al
- US 6589767 B1 20030708 - KNUTZON DEBORAH [US], et al
- US 6537750 B1 20030325 - SHORROSH BASIL S [US]
- US 6489461 B1 20021203 - DEHESH KATAYOON [US], et al
- US 6459018 B1 20021001 - KNUTZON DEBBIE [US]
- US 6380466 B1 20020430 - FACCIOCCI DANIEL [US]
- US 5512466 A 19960430 - KLEE HARRY J [US], et al
- US 6723837 B1 20040420 - KARUNANANDAA BALASULOJINI [US], et al
- US 6653530 B1 20031125 - SHEWMAKER CHRISTINE K [US], et al
- US 6541259 B1 20030401 - LASSNER MICHAEL W [US], et al
- US 5985605 A 19991116 - CHENG KUO JOAN [CA], et al
- US 6171640 B1 20010109 - BRINGE NEAL A [US]
- US RE37543 E 20020205 - KRUEGER NIELS [DE], et al
- US 6228623 B1 20010508 - ASRAR JAWED [US], et al
- US 5958745 A 19990928 - GRUY'S KENNETH JAMES [US], et al
- US 6946588 B2 20050920 - GRUY'S KENNETH J [US], et al
- US 6072103 A 20000606 - WU GUSUI [US], et al
- US 6812379 B2 20041102 - STAUB JEFFREY M [US]
- US 6774283 B1 20040810 - GOODMAN ROBERT M [US], et al
- US 6140075 A 20001031 - RUSSELL DAVID R [US], et al
- US 6080560 A 20000627 - RUSSELL DAVID R [US], et al
- US 6531648 B1 20030311 - LANAHAN MICHAEL B [US], et al
- US 6166292 A 20001226 - OSUMI CHIEKO [JP], et al
- US 5543576 A 19960806 - VAN OOIJEN ALBERT J J [NL], et al
- US 6011199 A 20000104 - SPEIRS JAMES [AU], et al
- US 5229114 A 19930720 - CREGAN PERRY B [US], et al
- US 5689041 A 19971118 - GREEF WILLY DE [BE], et al
- US 6576818 B1 20030610 - STALKER DAVID M [US], et al
- US 6271443 B1 20010807 - STALKER DAVID M [US], et al
- US 5981834 A 19991109 - JOHN MALIYAKAL E [US], et al
- US 5869720 A 19990209 - JOHN MALIYAKAL E [US]
- US 5998700 A 19991207 - LIGHTFOOT DAVID A [US], et al
- US 5107065 A 19920421 - SHEWMAKER CHRISTINE K [US], et al
- US 2006200878 A1 20060907 - LUTFIYYA LINDA [US], et al
- US 2008066206 A1 20080313 - ALLEN EDWARDS [US], et al
- US 97446907 A 20071012
- US 2009138985 A1 20090528 - MARTINELL BRIAN [US], et al
- MASCARENHAS ET AL., PLANT MOL. BIOL., vol. 15, 1990, pages 913 - 920
- GILISSEN ET AL., TRANSGENIC RESEARCH, vol. 7, 1998, pages 157 - 163
- JEFFERSON ET AL., PROC. NATL. ACAD. SCI., vol. 83, 1986, pages 8447 - 8451
- IWASE ET AL., PLANT BIOTECH., vol. 26, 2009, pages 29 - 38

- CENTURY ET AL., PLANT PHYSIOLOGY, vol. 147, 2008, pages 20 - 29
- ALLARD: "Principles of Plant Breeding", 1960, JOHN WILEY & SONS, pages: 50 - 98
- SNEEPHENDRIKSEN: "Principles of Crop Improvement", 1979, CENTER FOR AGRICULTURAL PUBLISHING AND DOCUMENTATION, pages: 369 - 399
- FEHR: "Soybeans: Improvement, Production and Uses", vol. 16, 1987, IOWA STATE UNIV., MACMILLAN PUB. CO., pages: 360 - 376
- FEHR, PRINCIPLES OF VARIETY DEVELOPMENT, THEORY AND TECHNIQUE, vol. 1
- WEI ET AL., J. PLANT PHYSIOL., vol. 160, 2003, pages 1241 - 1251
- PROMEGA NOTES MAGAZINE, 1996, pages 02

Citation (search report)

- [I] WO 2012112411 A1 20120823 - PIONEER HI BRED INT [US], et al
- [X] WO 2011088299 A1 20110721 - MONSANTO TECHNOLOGY LLC [US], et al
- [I] J. S. JEONG ET AL: "Root-Specific Expression of OsNAC10 Improves Drought Tolerance and Grain Yield in Rice under Field Drought Conditions", PLANT PHYSIOLOGY, vol. 153, no. 1, 1 May 2010 (2010-05-01), pages 185 - 197, XP055016776, ISSN: 0032-0889, DOI: 10.1104/pp.110.154773
- [A] XU Y ET AL: "CHARACTERIZATION OF A RICE GENE FAMILY ENCODING ROOT-SPECIFIC PROTEINS", PLANT MOLECULAR BIOLOGY, SPRINGER, DORDRECHT, NL, vol. 27, no. 2, 1 January 1995 (1995-01-01), pages 237 - 248, XP001085483, ISSN: 0167-4412, DOI: 10.1007/BF00020180
- [A] DATABASE EMBL [online] 10 August 2009 (2009-08-10), "SIC_Ba0107P09.F SIC_Ba Setaria italica genomic 5', genomic survey sequence.", XP002796163, retrieved from EBI accession no. EM_GSS:GS070593 Database accession no. GS070593

Designated contracting state (EPC)

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

DOCDB simple family (publication)

US 2014283201 A1 20140918; US 9617553 B2 20170411; AR 095463 A1 20151021; AR 118315 A2 20210929; AR 118316 A2 20210929; AR 118317 A2 20210929; AR 118318 A2 20210929; BR 112015023189 A2 20171121; CA 2905446 A1 20141002; CA 2905446 C 20230905; CA 3207141 A1 20141002; CL 2015002696 A1 20160205; CL 2018001357 A1 20180720; CL 2018001364 A1 20180720; CL 2018001365 A1 20180720; CL 2018001366 A1 20180720; CN 105307480 A 20160203; CN 107699563 A 20180216; CN 107699563 B 20220222; CN 110066796 A 20190730; CN 110066796 B 20231110; CR 20150554 A 20151120; CR 20200120 A 20200605; CR 20200121 A 20200703; CR 20200122 A 20200522; EP 2966981 A1 20160120; EP 2966981 A4 20170329; EP 2966981 B1 20191204; EP 3613278 A1 20200226; EP 3613279 A1 20200226; EP 3613280 A1 20200226; ES 2769898 T3 20200629; JP 2016514964 A 20160526; JP 201813983 A 20180726; JP 2020110167 A 20200727; JP 2020110168 A 20200727; JP 2020110169 A 20200727; JP 2020110170 A 20200727; JP 6679643 B2 20200415; JP 6889300 B2 20210618; JP 6889301 B2 20210618; JP 6889302 B2 20210618; JP 6889303 B2 20210618; MX 2015012557 A 20160112; MX 2019011816 A 20191107; MX 2019011817 A 20191107; MX 2019011818 A 20191107; MX 352666 B 20171201; MX 370800 B 20200107; RU 2015143455 A 20170417; RU 2675524 C2 20181219; UA 121457 C2 20200610; US 10421974 B2 20190924; US 11542516 B2 20230103; US 2017183674 A1 20170629; US 2020063150 A1 20200227; US 2023141324 A1 20230511; WO 2014159632 A1 20141002; ZA 201506453 B 20170125

DOCDB simple family (application)

US 201414207302 A 20140312; AR P140101066 A 20140314; AR P200100665 A 20200311; AR P200100666 A 20200311; AR P200100667 A 20200311; AR P200100668 A 20200311; BR 112015023189 A 20140312; CA 2905446 A 20140312; CA 3207141 A 20140312; CL 2015002696 A 20150914; CL 2018001357 A 20180518; CL 2018001364 A 20180522; CL 2018001365 A 20180522; CL 2018001366 A 20180522; CN 201480026708 A 20140312; CN 201710949095 A 20140312; CN 201910108570 A 20140312; CR 20150554 A 20151014; CR 20200120 A 20140312; CR 20200121 A 20140312; CR 20200122 A 20140312; EP 14774111 A 20140312; EP 19197938 A 20140312; EP 19197949 A 20140312; EP 19197957 A 20140312; ES 14774111 T 20140312; JP 2016501559 A 20140312; JP 2018067710 A 20180330; JP 2020047096 A 20200318; JP 2020047099 A 20200318; JP 2020047102 A 20200318; JP 2020047104 A 20200318; MX 2015012557 A 20140312; MX 2017011216 A 20140312; MX 2019011816 A 20150911; MX 2019011817 A 20140312; MX 2019011818 A 20150911; RU 2015143455 A 20140312; UA A201510007 A 20140312; US 2014024511 W 20140312; US 201715449534 A 20170303; US 201916540183 A 20190814; US 202218050791 A 20221028; ZA 201506453 A 20150902